UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF NEW YORK

In re: **Lehman Brothers Holdings, Inc., et al.,** **Debtors.**	**Case No. 1:08-bk-13555 (SCC)** **Chapter 11** **Jointly Administered**

DECLARATION OF CHARLES A. PAREKH, PH.D.

August 21, 2014

Table of Contents

List of Attachments

I. Scope of Work

1. I, Charles A. Parekh, Ph.D., have been asked by Alston & Bird LLP, Seward & Kissel LLP, Chapman and Cutler LLP, and Nixon Peabody LLP ("**Law Firms**"), counsel to Wilmington Trust, National Association; Wilmington Trust Company; Law Debenture Trust Company of New York; U.S. Bank, National Association; and Deutsche Bank National Trust Company ("**Trustee Group**" or "**Trustees**") to provide analysis on claims made by the Trustees against Lehman Brothers Holdings, Inc. ("**Lehman**") or its affiliates ("**Lehman Affiliates**"). The conclusions presented in this Declaration result from work performed by me and by my colleagues at Duff & Phelps, LLC ("**Duff & Phelps**").

2. Our work involves the analysis on claims related to breaches of the representations and warranties regarding residential mortgage loans sold by Lehman or Lehman Affiliates (collectively, the "**Covered Loans**") that were included in 255 residential mortgage backed securities ("**RMBS**") Trusts that closed on or after September 15, 2002 (collectively, the "**Covered Trusts**").

3. In connection with *The RMBS Trustees' Motion to (I) Increase the Reserve to $12.143 Billion and (II) to Estimate and Allow Their Claims for Covered Loans at $12.143 Billion Pursuant to Section 502(c) of the Bankruptcy Code* (this "**Matter**"), I have been asked to prepare this Declaration with respect to the following: 1) the validity of the methodological approach in selecting the sample of loans for review; 2) the statistical validity of extrapolating the sample results to the corresponding population of mortgage loans from which it was taken; 3) to calculate the realized losses and estimate the projected losses suffered by the Covered Trusts; and 4) the relative costs of estimating claims by the use of a sample of Covered Loans and by the process of reviewing each Covered Loan individually.

II. Experience and Qualifications

4. I am a Director at Duff & Phelps specializing in the application of economic and statistical analysis to damages, finance, and public policy issues. I have over fourteen years of experience working in dispute consulting and litigation support. My experience includes work in the securities, technology, and education industries.

5. Duff & Phelps is a premier global valuation and corporate finance advisor with expertise in complex valuation, dispute consulting, mergers and acquisitions, and restructuring. The firm's more than 1,000 employees serve a diverse range of clients from offices in North America, Europe and Asia. Duff & Phelps' experience includes numerous valuations of RMBS claims related to breaches of representations and warranties, including serving as the RMBS trustees' financial advisor in the Residential Capital ("**ResCap**") bankruptcy. Duff & Phelps' team includes professionals possessing a vast array of expertise in mortgage loan origination, bankruptcy and restructuring, financial forecasting, and statistical analysis.

6. I have led dozens of matters involving the use of statistical and economic modeling in order to calculate damages and losses. My RMBS experience includes leading the statistical and modeling teams in the use of sampling to estimate repurchase liabilities in multiple mortgage-backed securities litigations and bankruptcies, including the ResCap bankruptcy.

7. Additionally, I have extensive experience in applying statistical and economic analysis to litigation issues, including an assessment of the economic efficiency of electronic waste recycling, an analysis of damages from cigarette smoking, an examination of school efficiency and test score performance in New York City Public Schools, a study of school organization and educational outcomes, an evaluation of EPA clean air regulations, and an assessment of U.S. Postal Service pricing strategies. In the past, I provided expert testimony on the statistical evidence involved with randomly testing high school students for drug and alcohol use. In addition, I employed statistical analysis to investigate a whistle-blower complaint alleging the

University of Illinois College of Law inflated admissions data, including LSAT scores and GPAs of incoming classes.

8. I hold a Ph.D. concentrating in Public Finance from New York University, as well as a M.P.P. in Public Policy Analysis from the University of Chicago, and a B.A. in Economics from Colgate University.

9. The conclusions set forth in this Declaration are my own, and are based on work that I performed or work performed by my colleagues at Duff & Phelps under my supervision. In those instances where tasks were performed by my colleagues, I reviewed their work and determined that it was appropriate to rely upon that work.

10. My resume is attached to this Declaration as **Attachment I**.

11. The documents and other evidence considered in forming my conclusions are listed in **Attachment II**. I reserve the right to update this listing.

A. Summary of Conclusions

12. Based on study of the documents and other evidence considered, my experience with RMBS repurchase matters, the experience and knowledge of my colleagues at Duff & Phelps, and my experience, education, and training in forecasting and statistical analysis, I conclude the following:

- The sample was selected in such a manner that unbiased estimates of the breach rate can be obtained from the sample.[1]

- The sample size is sufficient to provide a minimum level of precision of +/- five percentage points at a 95% confidence level.

- Because the sample was properly selected and because the sample provides sufficient precision, the sample results may be extrapolated to the corresponding loan population.

[1] The sample refers to a subset of the Covered Loans selected for file review and is defined in Section III.

- The breach rates obtained from the sample can be used to accurately estimate the repurchase claims.

- The Covered Trusts suffered Realized Losses of $15.680 billion and are estimated to suffer an additional $5.548 billion in Projected Losses.[2]

- A loan-by-loan review would cost millions of dollars and involve many years of professional and Court time.

13. A discussion of the bases for my conclusions is set forth in the balance of this Declaration.

III. Overview of Loan Selection Process for File Review

A. Description of the Loan Population

14. The loan population in this Matter covers 416,091 Covered Loans sold to 255 Covered Trusts.[3] Of this population, 149,568 loans were identified as of the June 2012 remittance data[4] as loans with a realized loss, delinquent loans, or previously modified loans. These 149,568 loans comprise the population from which a random sample was selected (the "**Sampling Population**"). The Covered Trusts are listed in **Attachment III**.

B. Description of the Sample Selection Process

15. Cowen & Company ("**Cowen**") determined a sample of 5,000 loans to be reviewed in order to produce a sufficiently precise estimate of overall breach rates. As detailed in Table 1, this sample was chosen from the Sampling Population of 149,568 loans. As stated above, the sample was chosen as of June 2012 remittance data from a population of loans with a realized loss, delinquent loans, or previously modified loans.

[2] Realized Losses and Projected Losses are defined in Section VI. These loss figures are relied upon by the *Declaration of James H. Aronoff* in arriving at the Trustee's claim amount of $12.143 billion.
[3] NationStar Remittance Data, April 25, 2014, Wells Fargo Remittance Data, April 25, 2014.
[4] NationStar Remittance Data, June 25, 2012.

16. The population from which the sample was selected was classified into twelve cohorts by product type and vintage. These classifications were chosen to account for potential variation in breach rates between different loan products and vintages. The product type classification included three groups; loans which were classified as Prime, Alt-A, and Subprime, and the vintage was classified into four groups; loans included in a Trust issued in 2004 & prior, 2005, 2006, and 2007 & later, for a total of twelve cohorts.[5]

C. Description of File Review Process

17. Digital Risk, LLC ("**Digital Risk**") re-underwrote the sample of mortgage loans chosen by Cowen. Digital Risk reviewed the mortgage origination and servicing files for the sample loans to determine if a loan breached a representation and warranty included in the applicable trust documents. Digital Risk employed a materiality threshold to only include breaches of representations and warranties that materially and adversely affected the value of the mortgage loans underlying the Covered Trusts. Digital Risk received and reviewed 4,579 of the 5,000 loans in the sample. Digital Risk's findings are listed in **Attachment V**.

IV. Statistical Sampling and Inference

A. The Use of Statistical Sampling

18. Statistical sampling is a common and accepted methodology in scientific research and legal proceedings for exploring characteristics of a larger population based on a smaller portion, or sample, of that population.[6] In statistics, "a population is a collection of data based upon the observation of all conceivable sampling units."[7] Due to physical, economic, or time constraints it may be impossible to examine each

[5] Collateral product types are defined in Intex and given as **Attachment IV**.
[6] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, pp. 6.1-6.2.
[7] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 5.

item in the population, consequently, a solution is to examine a smaller subset, or sample, of the population and use the information provided by the sample to infer characteristics about the population.[8] A sample is "a set of data values actually collected on some of the sampling units from the population."[9] Samples are used for practicality, cost, and time restrictions that would occur with analyzing an entire population.[10] Statistics and statistical theory provide a logical process for using samples to arrive at conclusions about the population from which the sample is selected.[11]

B. Sampling Methods

19. A key element of sampling is employing a random sampling method to obtain a sample that is objective and will produce results that are closely representative of the total population.[12] The most basic sampling method is a simple random sample. A simple random sample can be defined as "a sample drawn in such a way that every member of the population has an equal chance of being included [in the sample]."[13] Generally, a simple random sample is selected through processes that replicate placing every element of the population in a hat and blindly drawing out the required number of sampling units. In practice this is done with random number generator functions found in computer programs such as Excel, SAS, or Stata.

20. When selecting a sample, it is possible to: 1) sample without replacement, where the sampling unit is removed from the population if it is selected for the sample, and 2) sample with replacement, where the sampling unit is replaced into the population and

[8] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 5.
[9] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 6.
[10] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, pp. 6.2-6.3.
[11] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 6.
[12] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, p. 6.3.
[13] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 362.

is eligible to be selected into the population multiple times. Though there are procedures that employ sampling with replacement, most sampling applications use sampling without replacement.[14]

21. When there are multiple groups within a population that are potentially different from each other, a stratified random sample may provide more precision than a simple random sample.[15] A stratified random sample divides the population, *ex-ante*, into subsets, or strata, that have a considerable amount of homogeneity among the members in each stratum; however, the strata themselves potentially differ from each other.[16] A stratified random sample first defines the various strata and then performs a random sample of each stratum.[17] Each random sample is determined independently and the number of units in each random sample may differ from stratum to stratum.[18] For example, if the researcher believes that it is likely that breach rates for a population of loans differ by vintage and product type, it is prudent to stratify the population into multiple vintage/product strata and then sample from within each stratum — allowing the breach rate to vary between each stratum. If, however, the researcher is incorrect, and breach rates do not vary between some combinations of strata, no bias is introduced, and those strata can be combined.

22. Using a stratified sample as opposed to a simple random sample may lead to increased precision in the data collected, because the variability within each stratum is reduced due to the increased internal homogeneity of each stratum.[19] Additionally,

[14] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, pp. 6.7-6.8.
[15] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, pp. 6.8-6.9.
[16] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, p. 6.5.
[17] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 363.
[18] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 363.
[19] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, p. 6.9.

a stratified sample can be more precise because splitting the population into strata and choosing a random sample from each stratum can increase the likelihood that small subsets of the population are adequately represented in the sample.[20]

23. The Covered Trusts comprise 255 Trusts issued between 2002 and 2008, collateralized by a population of 416,091 Covered Loans that were, partially or in whole, originated by Lehman or Lehman affiliates. Of the Covered Loans, 149,568 were loans that suffered a realized loss, were delinquent loans, or previously modified loans.[21] These 149,568 loans are the Sampling Population. The Sampling Population was divided into twelve cohorts, and a stratified random sample was drawn from the each stratum of four vintage groups and three product types (a total of twelve cohorts). Table 1 presents the sample and underlying population size for each of the twelve cohorts.

Table 1: Cohorts with Sample Size and Population Size

	Prime		**Alt-A**		**Subprime**		**Total**	
	Sample	**Pop.**	**Sample**	**Pop.**	**Sample**	**Pop.**	**Sample**	**Pop.**
2004 & Prior	350	2,909	360	4,198	310	1,563	1,020	**8,670**
2005	360	5,922	370	10,894	370	10,158	1,100	**26,974**
2006	240	878	610	41,093	610	14,747	1,460	**56,718**
2007 & 2008	200	420	610	32,094	610	24,692	1,420	**57,206**
Total	**1,150**	**10,129**	**1,950**	**88,279**	**1,900**	**51,160**	**5,000**	**149,568**

24. Cowen determined a sample that was randomly selected using the random number generator in standard statistical software. Specifically, a random group of loans was selected from within each of the twelve cohorts from the Sampling Population.

25. The Sampling Population of 149,568 loans includes loans that suffered a realized loss, delinquent loans, or previously modified loans and is known as an *adverse sample*. An adverse sample is used to estimate breach rates for loans that suffered a loss or are projected to suffer a loss in the future. Because sample results can only be extrapolated to the Sampling Population, results from the sample are extrapolated to loans that suffered a loss or loans that are projected to suffer a loss. In other words, because an adverse sample was employed, any estimates of claims resulting from the

[20] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 363.
[21] NationStar Remittance Data, June 25, 2012.

use of the adverse sample can only arise from Covered Loans that suffered a realized loss or are projected to suffer a loss.

26. The sampling methodology and selection process that Cowen employed is sufficient to ensure the sample within each cohort is random within that cohort. Because the sample selection methodology is designed to generate a sample that is random within each cohort, the loan review results for each cohort sample are able to be applied to the twelve corresponding cohort populations of Covered Loans that suffered a realized loss or are projected to suffer a loss.

C. Sample Size

27. A statistically valid sample is a sample of sufficient size to provide a representation of the population at a predetermined desired level of precision. Two common misconceptions about sample size are that 1) the sample must represent a large fraction of the population, and 2) the sample must be a fixed percentage of the population (e.g., 20% or 25%).[22] In fact, neither is true. While a larger random sample size will provide a more precise estimate of the breach rate in the corresponding population, a small sample size can provide useful estimates as long as the sample is random. In addition, simply including more units in a sample will quickly reach a point of diminishing returns. That is, the inclusion of additional information or units in a sample may not be commensurate with the additional time and costs needed to investigate these additional units in the sample.[23]

28. One determinant of the proper sample size is that the sample should be large enough to provide results within an acceptable level of confidence — a level that is chosen *ex ante* to the sampling process along with a desired level of precision, known as a *margin of error*. Confidence levels and confidence intervals provide crucial information of how likely it is that a sample estimate can properly be applied to

[22] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, p. 6.3.

[23] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 403.

estimate a population value.[24] A confidence interval is a statistically derived range of numerical values that are likely to include the population parameter with a stated degree of confidence.[25] Put another way, confidence intervals are an estimated range of values with a given probability (confidence level) of covering the true population value.[26] A sample point estimate may fall outside of the confidence interval due to an odd sample; however, the confidence interval and confidence level metrics allow for one to determine the likelihood of this scenario occurring.

29. The desired level of confidence depends on the application, but, in general a 90% to 99% level is usually employed in scientific studies.[27] The sample size in this Matter is sufficient to produce a maximum margin of error of +/- five percentage points at a 95% level of confidence.[28] For example, if a sample breach rate is found to be 50% and the margin of error is +/- five percentage points, then a 95% confidence interval around the estimate means that we are 95% confident that the population breach rate is within 45% and 55%.

D. Statistical Inference

30. Statistical inference combines the concepts of randomness and sample size to allow the researcher to draw statistical conclusions for the breach rate to the Sampling Population. Inferences are based upon a combination of probability and proper sampling and allow for the use of the sample data to estimate both the breach rate and how much uncertainty surrounds that breach rate (often in the form of a confidence

[24] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 391.
[25] Khazanie, Ramakant, *Statistics in a World of Applications 4th Ed.*, New York, HarperCollins College Publishers, 1996, p. 391.
[26] Hays, William L. and Winkler, Robert L., *Statistics: Probability, Inference, and Decision*, New York, Holt, Rinehart and Winston, Inc., 1971, p. 327.
[27] Gustafson, Mark A. and Peter P. Simon, "Use of Statistical Sampling in Litigation," in *Litigation Services Handbook: The Role of the Financial Expert, 5th Ed.*, ed. Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, Hoboken, NJ, John Wiley & Sons, 1996, p. 6.5.
[28] Confidence levels and confidence intervals convey identical information in two different ways. This may cause confusion in that some researchers use a confidence level of 5% to correspond to a confidence interval of 95% or a 10% confidence level to correspond to a 90% confidence interval. To avoid confusion, this Declaration will refer to both confidence levels and confidence intervals with the same percentage.

interval).[29] Based on these concepts, the estimated breach rates for each of the twelve cohorts are presented in Table 2. These results show the level of precision (the margin of error) around each cohort's breach rate sample finding at a 95% confidence level. For example, for 2004 & Prior Prime loans, the estimate of the breach rate from the sample review is 54.3%, with a confidence interval around the breach rate of 49.4% to 59.2% (implying a margin of error of 4.9 percentage points). In other words, based on the sample size and sample selection methodology, we are 95% confident that the breach rate for 2004 & Prior Prime loans is between 49.4% and 59.2%, with a best estimate of 54.3%.

Table 2: 95% Confidence Interval for Breach Rate

	Prime		Alt-A		Subprime	
	Breach Rate	**95% C.I.**	**Breach Rate**	**95% C.I.**	**Breach Rate**	**95% C.I.**
2004 & Prior	54.3%	49.4% – 59.2%	51.8%	46.9% – 56.7%	71.3%	66.8% – 75.8%
2005	45.8%	40.8% – 50.8%	68.6%	64.0% – 73.2%	60.7%	55.8% – 65.6%
2006	55.2%	49.8% – 60.6%	59.4%	55.5% – 63.3%	51.4%	47.5% – 55.3%
2007 & 2008	58.5%	53.6% – 63.4%	58.4%	54.5% – 62.3%	53.0%	49.1% – 56.9%

E. Monte Carlo Simulation

31. One manner in which to demonstrate the relationship between precision of the breach rate and sample size is through the use of Monte Carlo simulations. In other words, I use Monte Carlo simulations to confirm that the sample size is sufficient to provide estimates of the breach rate that have a margin of error of +/- five percentage points at a 95% confidence level.

32. Monte Carlo simulation "is a well-accepted valuation technique"[30] that employs thousands or millions of simulations to arrive at an estimate of unknown values.[31] The

[29] Wheelan, Charles, *Naked Statistics: Stripping the Dread from the Data*, New York, W. W. Norton & Company, 2013, p. 127.
[30] *Litigation Services Handbook: Role of the Financial Expert*, 5th Edition. 2012, p. 4.19.
[31] *Litigation Services Handbook: Role of the Financial Expert*, 5th Edition. 2012, p. 4.20.

technique of Monte Carlo simulations was formally developed in the mid-1940s[32] by mathematicians working on the Manhattan Project[33] and derives its name from the famous casinos in Monte Carlo, Monaco.

33. The Monte Carlo simulation begins, on a cohort-by-cohort basis, by using statistical software to simulate a population with the specific breach rate for the population that was determined through Digital Risk's review.[34] From that population, I select a sample and measure the breach rate compared to the value determined by Digital Risk. This process was repeated 10,000 times, and the results are aggregated to determine the probability distribution, i.e., the margin of error, surrounding the sample breach rate at a 95% level of confidence. [35]

34. Specifically, for each cohort, a sample of the same size as the sample that was reviewed by Digital Risk was drawn from each cohort's Sampling Population. Based on the cohort's breach rate determined by Digital Risk and the known statistical properties of samples and Sampling Populations, a simulated breach rate was determined via the computer simulation. This process was repeated for a total of 10,000 simulated samples. The results for each cohort were aggregated to determine the estimated distribution of precision around each breach rate.

[32] Metropolis, N. "The Beginning of the Monte Carlo Method," *Los Alamos Science: Special Issue 1987.*
[33] *Litigation Services Handbook: Role of the Financial Expert,* 5th Edition. 2012, pp. 4.19-20.
[34] See Attachment V.
[35] *Litigation Services Handbook: Role of the Financial Expert,* 4th Edition. 2007, pp. 11.21-2.

35. The results of the Monte Carlo simulations are presented in Table 3 and confirm that, consistent with established statistical formulas, the sample sizes reviewed by Digital Risk are of sufficient size to provide results that are at or above the desired minimum level of precision of +/- five percentage points at a 95% confidence level.

Table 3: Results of Monte Carlo at 95% Confidence Level

	Sample Size	Population Size	Breach Rate	Margin of Error
Prime 2004 & Prior	337	2,909	54%	+/- 5%
Alt-A 2004 & Prior	355	4,198	52%	+/- 5%
Subprime 2004 & Prior	303	1,563	74%	+/- 5%
Prime 2005	360	5,922	46%	+/- 5%
Alt-A 2005	370	10,894	69%	+/- 5%
Subprime 2005	257	10,158	63%	+/- 5%
Prime 2006	239	878	55%	+/- 5%
Alt-A 2006	567	41,093	60%	+/- 4%
Subprime 2006	492	14,747	51%	+/- 4%
Prime 2007 & Later	200	420	59%	+/- 5%
Alt-A 2007 & Later	610	32,094	59%	+/- 4%
Subprime 2007 & Later	489	24,692	53%	+/- 4%

V. Extrapolation of the Results to the Population

36. Because the sample was drawn using an appropriate random sampling procedure, and the sample size is large enough to provide results with a known level of precision at the 95% confidence level, it is appropriate and reliable to extrapolate the results of the sample to the Sampling Population. Specifically, each cohort's breach rate, determined by Digital Risk's loan file review, can be used as a statistically valid estimate of that cohort's breach rate for all of the loans in that cohort that suffered a realized loss or are projected to suffer a loss.

37. Additionally, since the sample breach rate is a sound estimate of the population breach rate, it can be used for resulting calculations involving the population. Specifically, the sample breach rate can be used in conjunction with Covered Trust losses to calculate the Trustees' RMBS Claim for Covered Loans.

VI. Total Collateral Losses

38. In this section, I explain the inputs and assumptions used to determine the Total Collateral Losses ("**Total Losses**") for the Covered Loans. The components of Total Losses are realized losses, which are losses that have already occurred, as of the April 25, 2014, remittance period ("**Realized Losses**") and Projected Losses, which are losses that have not yet occurred but are projected to occur ("**Projected Losses**").

A. Realized Losses

39. Realized Losses mean the recognized losses from liquidated loans as well as the forgiven principal on modified loans. Loans are liquidated, or written off, through the foreclosure process once the mortgage borrower has defaulted on his payments. For purposes of this analysis, forgiven principal balance on a modified loan is considered a Realized Loss. Realized loss data are reported on a monthly basis and were calculated as of the April 25, 2014, remittance period. As Table 4 shows, the Realized Losses are $15.7 billion across the twelve cohorts.

Table 4: Realized Losses by Cohort

Cohort	Realized Losses
Prime <=2004	$208,384,950
Prime 2005	$503,562,833
Prime 2006	$92,781,704
Prime 2007-2008	$60,715,913
Alt-A <=2004	$157,730,824
Alt-A 2005	$1,045,652,831
Alt-A 2006	$4,065,769,053
Alt-A 2007-2008	$4,927,182,648
Subprime <=2004	$48,656,618
Subprime 2005	$524,094,924
Subprime 2006	$1,564,006,589
Subprime 2007-2008	$2,481,650,460
Total	**$15,680,189,347**

B. Projected Losses

40. Projected Losses are losses that have not been realized as of April 25, 2014, but are expected to occur at a subsequent time. In arriving at my estimates of Projected

Losses, I worked closely with, and employed the expertise of, Duff & Phelps professionals with significant experience in projecting collateral losses in RMBS Trusts. These experienced professionals assisted me in arriving at the inputs to my loss projection model and in estimating Projected Losses.

41. To determine the Projected Losses for the mortgage pool underlying each of the RMBS, and consequently the Total Losses, we considered the timing of the principal repayments of the mortgage loans (borrowers may repay early through partial repayments (a curtailment) or in full (generally through the sale of the home or a refinance)) and the level, timing, and severity of defaults. These inputs, listed in **Attachment VI**, are:

- Conditional Repayment Rate ("**CRR**"): the rate at which there are unscheduled declines in the outstanding collateral balance due to voluntary prepayments in excess of scheduled amounts due. CRR is expressed as a compound annual rate. For example, a CRR of 10% means that 10% of the outstanding collateral loan balance is projected to voluntarily prepay over a one year period.
- Conditional Default Rate ("**CDR**"): the rate at which there are unscheduled declines in the outstanding collateral balance due to loan defaults. CDR is expressed as an annual compound rate. For example, a CDR of 10% means that 10% of the outstanding collateral loan balance is projected to default over a one year period.
- Loss Severity ("**Severity**"): the percentage of the loan balance that is projected to be written off when a mortgage is liquidated. For example, if a lender is projected to receive $300,000 in net proceeds (after foreclosures costs, servicer reimbursements, and other various expenses) from the sale of a property collateralizing a $400,000 mortgage loan, the loss amount would be $100,000 and the loss severity would equal 25%.

42. Cash flows are determined through a mechanical input of these assumptions, using Intex Solutions' ("**Intex**") IntexCalc model. Intex is a global provider of structured fixed income deal models and maintains the standard cash flow engine used by

investors, investment banks, and broker dealers.[36] "Intex has modeled nearly every public deal [since 1990]"[37], including all of the Covered Trusts and is widely accepted in the financial services and mortgage industries.

43. The outputs from Intex consist of collateral-level cash flows, which project forward from the determination date (April 25, 2014) the periodic principal, and interest mortgage loan payments, net of loss upon defaults based on the input assumptions. Within the Intex cash flow model, such assumptions are applied pro-rata across all loans in a mortgage pool.[38]

44. To forecast the expected collateral cash flows and losses, I assessed the then-current status of the mortgage pools as of the determination date. I reviewed the historical CDRs, CRRs, and Severities for each mortgage pool in order to derive my approach for developing forward projections.

45. The result is a forecast of the expected future performance of the mortgage pool. I based my forecast on the six-month trailing performance of the mortgage pool. This is a standard approach that market participants would use given the age of the mortgage pools.[39] For example, mortgage pools composed of prime-quality collateral typically experience rising default rates early in the mortgage pool's seasoning, and defaults peaking at about year five and then declining in later years.[40] All of the mortgage pools reviewed had at least six years of seasoning, and the majority of the mortgage pools had significantly more than six years of seasoning. As a result, default and prepayment rates have stabilized, and are expected to remain stable going forward. Therefore, the use of the last six months' pool performance as forward projections for cash flow modeling is a reasonable and common approach to estimate future

[36] http://www.intex.com/main/company.php.
[37] http://www.intex.com/main/company.php.
[38] The Intex engine does not pick and choose loans to prepay and default. Rather, a percentage of each loan is prepaid and/or defaulted on a pro-rata basis across the entire collateral pool that supports the transaction. Consequently, losses were projected at the Trust level and scaled proportionately to the Covered Loans percentage of each Covered Trust.
[39] In cases where the six-month trailing performance is not reported, I used the average rates of Covered Trusts with comparable vintage and product types.
[40] Brown and Larson, "The Issue of Retail Credit Risk Seasoning and Its Impact Upon Basel II PD Estimation," Promontory Financial Group, June 26, 2007, p. 7.

mortgage pool performance.[41] As shown in Table 5, Projected Losses on the Covered Loans are estimated to total $5.5 billion.

Table 5: Projected Losses by Cohort

Cohort	Projected Losses
Prime <=2004	$139,468,446
Prime 2005	$203,137,673
Prime 2006	$35,956,547
Prime 2007-2008	$24,062,303
Alt-A <=2004	$56,737,439
Alt-A 2005	$369,947,234
Alt-A 2006	$989,163,390
Alt-A 2007-2008	$1,812,042,109
Subprime <=2004	$20,681,463
Subprime 2005	$81,174,329
Subprime 2006	$559,169,137
Subprime 2007-2008	$1,256,641,957
Total	**$5,548,182,027**

C. Illustration of Cash Flow Modeling Inputs

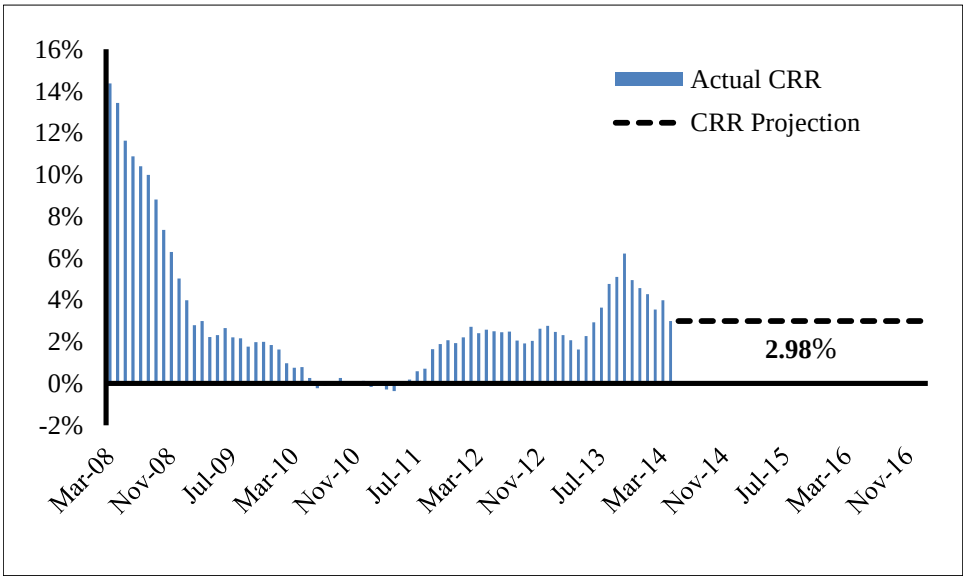
46. In this section, I use the mortgage pool backing Structured Asset Investment Loan Trust, Series 2005-7 ("**SAIL 2005-7**") to illustrate the relationship between historical performance and the forward projections I used to model the mortgage pool's cash flows. I used the same methodology to derive the forward projections for each of the mortgage pools reviewed.

[41] Jablansky and Wang. "Perfect Pay and Credit Burnout: Non-Agency Valuation Implications, Securitized Product Insights," The Royal Bank of Scotland, March 10, 2011, p. 29.

1. Forward Projection of Voluntary Prepayment Rates

47. As of April 25, 2014, the trailing six-month average CRR was 2.98% for the mortgage pool backing SAIL 2005-7. Figure 1 below shows actual CRR for the mortgage pool through April 25, 2014, as well as the projection made by my colleagues at Duff & Phelps based on the then-current six-month trailing average CRR:

Figure 1: Actual and Projected Voluntary Prepayment Rates

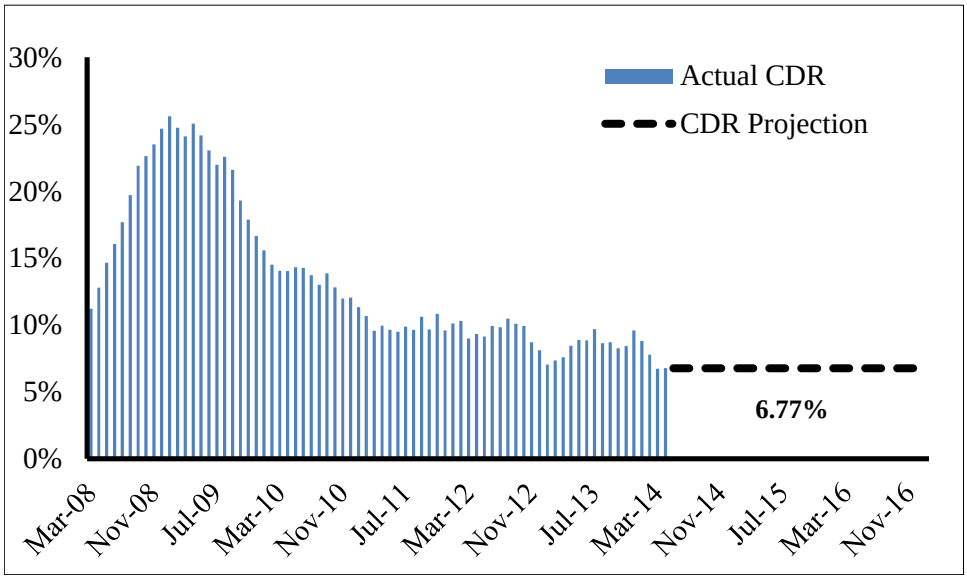


48. As can be seen in Figure 1, voluntary prepayments peaked in March 2008 and have been relatively stable for the past five years. The projection closely approximates the mortgage pool's historical performance.

2. Forward Projection of Default Rates

49. As of April 25, 2014, the trailing six-month average CDR was 6.77% for the mortgage pool backing SAIL 2005-7. Figure 2 below shows historical default rates for the mortgage pool through April 25, 2014, as well as the projection made by Duff & Phelps based on the then-current six-month trailing average CDR:

Figure 2: Actual and Projected Default Rates

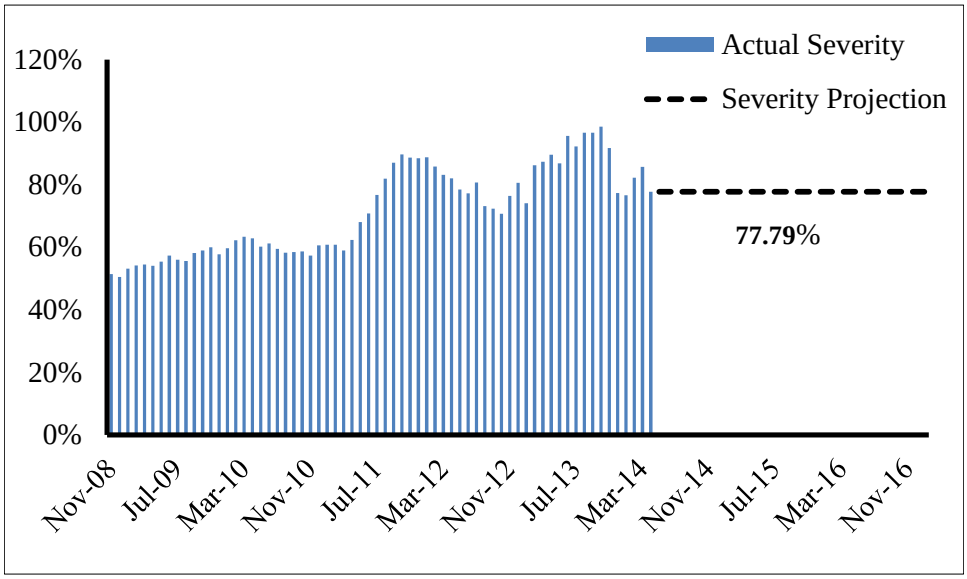


50. As can be seen in Figure 2, defaults peaked around July 2009 and since have remained somewhat volatile at a fairly low level for about four years. Once again, the projection appears reasonable, given the historical performance of the mortgage pool.

3. Forward Projection of Severity of Loss

51. As of April 25, 2014, the trailing six-month average severity of loss upon default was 77.79% for the mortgage pool backing SAIL 2005-7. Figure 3, below, shows historical severity rates for the mortgage pool through April 25, 2014, as well as the projection made by Duff & Phelps based on the then-current six-month trailing average severity:

Figure 3: Actual and Projected Severity of Loss



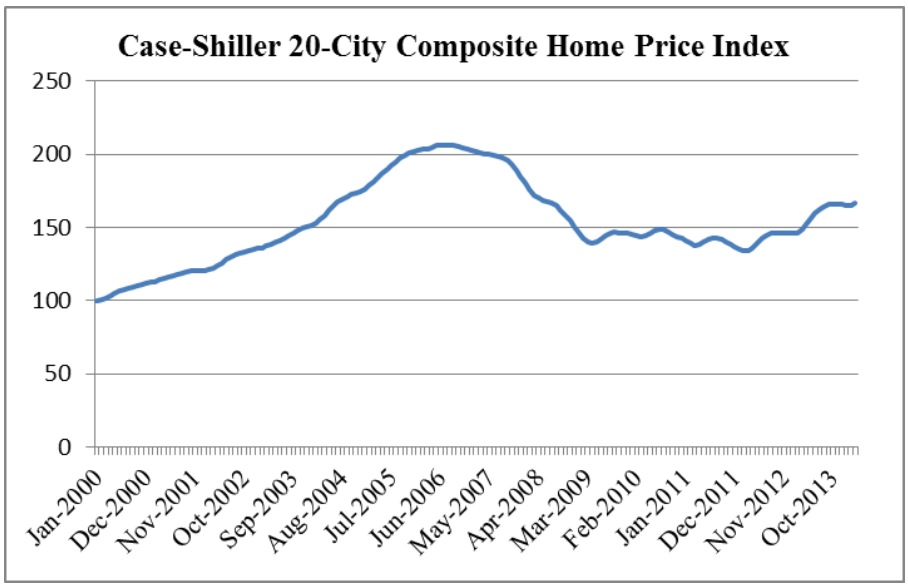
52. The data series begins in November 2008, just before the housing market was to begin its recovery. This can be seen in the Case-Shiller 20-City Composite Home Price Index in Figure 4, below. The S&P/Case-Shiller 20-City Composite Home Price Index measures the value of residential real estate in 20 metropolitan areas of the U.S. It is intended to quantify changes in the total value of all existing single-family housing stock.[42]

53. It is notable that even during the modest housing price recovery, severity of losses was elevated in late 2013 for the mortgage pool. The historical performance of the

[42] http://us.spindices.com/indices/real-estate/sp-case-shiller-20-city-composite-home-price-index.

mortgage pool, combined with the macroeconomic environment surrounding housing prices, supports the reasonableness of the forward projection.

Figure 4: Case-Shiller 20-City Composite Home Price Index



D. Total Losses

54. Total Losses for all the Covered Trusts can be calculated by summing the Covered Loans' Realized Losses and the Projected Losses. As Table 6 shows, the Total Losses for all the Covered Trusts are calculated to be $21.2 billion.

Table 6: Total Losses by Cohort

Cohort	Total Losses (Realized + Projected)
Prime <=2004	$347,853,396
Prime 2005	$706,700,506
Prime 2006	$128,738,252
Prime 2007-2008	$84,778,216
Alt-A <=2004	$214,468,263
Alt-A 2005	$1,415,600,065
Alt-A 2006	$5,054,932,443
Alt-A 2007-2008	$6,739,224,756
Subprime <=2004	$69,338,082
Subprime 2005	$605,269,253
Subprime 2006	$2,123,175,726
Subprime 2007-2008	$3,738,292,416
Total	**$21,228,371,374**

VII. Time and Cost Associated with a Population-Based Review

55. Sampling in RMBS matters is used to generate estimates of breach rates, when reviewing the entire population is cost-prohibitive, but when a smaller subset of that population can be effectively reviewed. Since this Matter falls under such a description, it is instructive to compare the resources involved with sampling with the increased resources of a full-population loan review. In addition, depending on the treatment of missing/incomplete loan files, in some instances, sampling can provide greater accuracy than a complete loan review can provide.

56. Table 7 provides a comparison of resources involved with reviewing a sample of loans to the resources involved with reviewing the entire population. The calculations employ estimates of review time and cost per loan based on conversations with Digital Risk and their actual experience in reviewing the sample of 5,000 loans, as well as my experience, and the experience of those at Duff & Phelps, in the time and cost involved with determining breaches in Court.

57. Review costs per loan decrease for the population review, because there are possibly some economies of scale and gains from experience. In reality, these gains would likely be offset by the fact that there would be greater numbers of missing and difficult-to-locate loan files — driving the time and cost of review higher for the population review. In order to maintain a conservative estimate of the cost of the population review, I ignored these offsets. In addition, in order to provide a conservative estimate, I only include costs for the population of 149,568 loans that pertain to the sample of 5,000 and not the entire population of 416,091 Covered Loans.

Table 7: Comparison of Sample Review vs. Population Review

	Sample of Loans	**Population of Loans**
Loan Review Time and Expense		
Number of Loans	5,000	149,568[1]
Review Cost	$250 / Loan[2]	$200 / Loan
Review Speed / Underwriter	3 Loans / Day	3 Loans / Day
Review Team Size	10 UWs = 30 Loans / Day	40 UWs = 120 Loans / Day
Cost of Loan Review	$1.25 million	$30 million[3]
Time of Loan Review	Less than 1 Year	More than 4.5 Years
Court Time and Expense		
Time to Review Claim	2 Days	More than 41 Years[4]
Professional Cost @ $3,000 / Hour	$42,000	$224 million
Precision	+/- 5% (or better) at 95% Conf.	100%
Cost of Loan Review	**$1.3 million**	**$250 million**
Court Time	**Less than 1 Week**	**More than 45 Years**

Notes: 1) As noted earlier, the population of covered loans is 416,091. However, this table only considers the Sampling Population of 149,568 loans that corresponds to the adverse sample. 2) The cost per loan of $250 is from 2012, and is likely to be significantly higher today. 3) Loan review costs do not include any costs incurred by Lehman to conduct their own file review. 4) Based on one hour of review per loan and 50% breach rate, if the Court were to *exclusively* dedicate seven hours per day, five days per week, 52 weeks per year to reviewing RMBS claims.

58. As shown in Table 7, results from reviewing a sample of loans are achieved at an overwhelmingly lower cost in terms of professional fees and Court time, as compared to the resources associated with reviewing the entire population of Covered Loans.

VIII. Reservation of Rights and Compensation Disclosure

59. I reserve the right revise or expand my conclusions to reflect any additional conclusions formulated upon newly acquired information, or arising from reflection and reconsideration of the conclusions based upon views expressed by expert witnesses, upon further study and information, including documentary and testimonial evidence introduced through deposition and trial.

60. Duff & Phelps charges an hourly rate, based on title and experience, for my services and the services of the team working on this Matter. Duff & Phelps' fees are not based, in part, or in whole, upon any conclusions presented in this Declaration, nor are they based, in part or in whole, upon the outcome of this Matter. In this Matter, Duff & Phelps bills my time at an hourly rate of $810 per hour.

61. This Declaration is not to be reproduced, distributed, disclosed, or used for any purposes other than this Matter without prior written approval.

I declare under penalty of perjury that the foregoing is true and correct.

Executed the 21st day of August 2014, in Chicago, IL

Charles A. Parekh